Memo Gr 11 P1

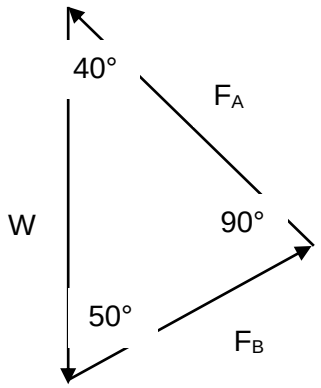
1.1 B
1.2 D
1.3 C
1.4 B
1.5 A
1.6 B
1.7 B
1.8 D
1.9 D
1.10 B **[10 x 2 = 20]**

Question 2

2.1.1 Forces are in equilibrium. / Resultant force is zero. ✓

2.1.2 A single vector that has the same effect as two or more vectors combined. ✓✓

2.2



2.3 Rope A ✓

Longer side (stronger force) opposite larger angle ✓

2.4 $\sin 50° = F_A / W$ ✓

$W = 500 / \sin 50°$ ✓ $= 652,7$ N ✓

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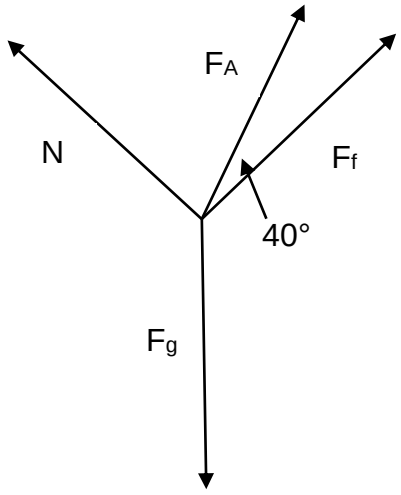
Question 3

3.1 An object remains at rest or continues with constant velocity unless acted upon by a net or resultant force.

3.2



1 mark per vector

3.3 $F_{net} = 0$

$F_f - F_{g\,II} + F_{A\,II} = 0$ ✓

F_f – 150(9,8)✓.sin 35°✓+ 100. cos 40°✓ = 0

F_f = 766,55 N ✓

3.4 Perpendicular:

N + F sin 40° ✓= mg cos 35°✓

N = mg cos 35° - F sin 40°

Parallel:

mg sin 35°✓ = F_f + F cos 40°✓

mg sin 35° = μN ✓+ F cos 40°

mg sin 35° = 0,7(mg cos 35° - F sin 40°) ✓ + F cos 40°

mg (sin 35° - 0,7 cos 35°) = F (cos 40° - 0,7 sin 40°)

150 (9,8) (sin 35° - 0,7 cos 35°) = F (cos 40° - 0,7 sin 40°)

F = 0,79 N✓

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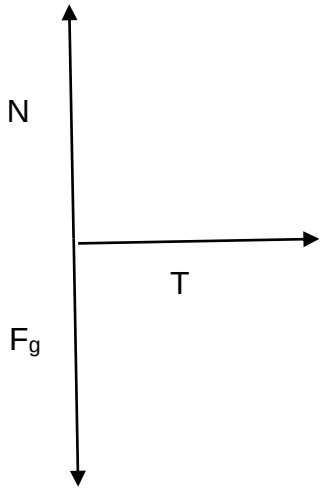
Question 4

4.1 When a net force acts on an object with mass, the object will accelerate in the direction of the net force. The acceleration is directly proportional to the force and inversely proportional to the mass of the object. ✓✓

4.2.1



1 mark per vector

4.2.2 $F_{net} = ma$ ✓

$T = 5.a$ ✓

$F_g - T = m.a$ ✓

$20(9,8) - T = 20.a$ ✓

$20(9,8) - 5.a = 20.a$ ✓

$a = 7,84\ m.s^{-2}$ ✓

4.2.3 $T = 5.a$ ✓

$T = 5\ (7,84)$

$T = 39,2N$ ✓

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Question 5

5.1 Every object in the universe attracts every other object in the universe with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. (2)

5.2 equal to ✓

5.3 If body A exerts a force on body B, then body B will simultaneously exert a force on body A. The forces are equal in magnitude but opposite in direction. ✓✓

5.4 $F = G.m_1.m_2 / r^2$ ✓

$F = 6,67 \times 10^{-11}$✓ $.5,98 \times 10^{24} .1 \times 10^{15}$✓ $/ (1,3 \times 10^{11})^2$✓

$F = 2,36 \times 10^7$ N✓

5.5 $(0,5)^2 = ¼$ ✓✓

[12]

Question 6

6.1 Change in the direction of a light ray due to a change in speed when light travels from one medium into the other of different optical density. ✓✓

6.2 $n_i \sin \theta_i = n_r \sin \theta_r$ ✓

$1,66 \sin \theta_c$ ✓$= 1. \sin 90°$✓

$\Theta_c = 37,04°$ ✓

6.3.1 45° ✓

6.3.2 Total internal reflection ✓

6.3.3 $\theta_i > \theta_c$ ✓

6.4 $n = c/v$ ✓

$1,66 = 3 \times 10^8 / v$ ✓

$v = 1,81 \times 10^8$ m.s^{-1} ✓

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Question 7

7.1.1 The ability of a wave to spread out in wave fronts as the wave passes through a small aperture or around a sharp edge. ✓✓

7.1.2 Every point of a wave front serves as a point source of spherical, secondary waves that move forward with the same speed as the wave. ✓✓

7.2.1 How will wavelength effect the degree of diffraction of light? ✓✓

Must be open ended question (no just a yes/no answer).

Must contain dependant and independent variable.

7.2.2 wavelength

7.2.3 degree of diffraction (length of x)

7.3 Degree of diffraction is directly proportional to the wavelength.

7.4 red

7.5 increase

[11]

[100]